

Application No. 10/065,959
Docket No. 17MY-7106
Amendment dated May 4, 2004
Reply to Office Action of March 4, 2004

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

Claim 1 (currently amended): A process of forming a diffusion aluminide coating on a component having a ceramic coating on a first surface thereof, the process comprising the steps of:

applying a substantially uniform coating of an activator-free slurry on a second surface of the component that is not covered by the ceramic coating, the slurry consisting essentially of ~~containing~~ aluminum particles in an inorganic binder solution; and then

in an inert or reducing atmosphere, heating the component to melt the aluminum particles and diffuse aluminum into the second surface of the component and thereby form a diffusion aluminide coating on the second surface, the ceramic coating being substantially undamaged by the slurry during the heating step.

Claim 2 (original): A process according to claim 1, wherein the second surface is an internal surface defined by a hole in the component, and the first surface is an external surface intersected by the hole.

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Claim 3 (original): A process according to claim 2, further comprising the steps of depositing the ceramic coating on the first surface of the component, and then machining the hole in the component prior to applying the slurry.

Claim 4 (previously presented): A process according to claim 1, wherein the applying step comprises spraying the slurry on the second surface.

Claim 5 (previously presented): A process according to claim 1, wherein the applying step comprises applying the coating on the second surface and on the ceramic coating.

Claim 6 (original): A process according to claim 1, wherein the component is heated to about 960°C to about 1090°C.

Claim 7 (original): A process according to claim 1, wherein the component is formed of a superalloy.

Claim 8 (original): A process according to claim 1, wherein the component is an air-cooled gas turbine engine component.

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Claim 9 (currently amended): A process of forming a diffusion aluminide coating on a component having a ceramic coating on a first surface thereof, the process comprising the steps of:

applying a substantially uniform coating of an activator-free slurry on a second surface of the component that is not covered by the ceramic coating, the slurry containing aluminum particles in an inorganic binder solution; and then
in an inert or reducing atmosphere, heating the component to melt the aluminum particles and diffuse aluminum into the second surface of the component and thereby form a diffusion aluminide coating on the second surface, the ceramic coating being substantially undamaged by the slurry during the heating step, according to claim 1; wherein the process repairs a portion of a diffusion aluminide bond coat on the second surface and exposed by a spalled region of the ceramic coating.

Claim 10 (previously presented): A process for forming a diffusion aluminide coating on an air-cooled superalloy component of a gas turbine engine, the process comprising the steps of:

depositing a ceramic coating on an external surface of the component;

machining holes in the component to define internal surfaces within the component, the holes intersecting the external surface of the component and at least one internal passage within the component;

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applying a substantially uniform coating of an activator-free slurry to the internal surfaces of the component, the slurry consisting essentially of aluminum particles in an inorganic binder solution;

drying the coating; and then

in an inert or reducing atmosphere, heating the component to a temperature of about 960°C to about 1090°C that is held for a duration sufficient to melt the aluminum particles, diffuse aluminum into the internal surfaces, and form a diffusion aluminide coating on the internal surfaces, the ceramic coating being substantially undamaged by the slurry during the heating step.

Claim 11 (previously presented): A process according to claim 10, wherein the applying step comprises flowing the slurry through the internal passage and the holes to deposit the coating on the internal surfaces.

Claim 12 (previously presented): A process according to claim 10, wherein the applying step comprises applying the coating on the internal surfaces and on the ceramic coating.

Claim 13 (previously presented): A process according to claim 10, wherein the slurry consists of the aluminum particles and the inorganic binder solution.

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Claim 14 (previously presented): A process according to claim 1, wherein the slurry consists essentially of the aluminum particles, the inorganic binder solution, silicon and chromia.

Claim 15 (previously presented): A process according to claim 1, wherein the slurry consists of the aluminum particles, the inorganic binder solution, silicon and chromia.

Claim 16 (previously presented): A process according to claim 2, wherein the applying step comprises flowing the slurry through the hole in the component to deposit the coating.